Colonel Robert H. Reardon, Jr.
U.S. Army Corps of Engineers
Norfolk District
803 Front Street
Norfolk, Virginia 23510-1096

Attn: Steve Martin
Regulatory Branch

Re: Eddie Vaughan, Permit Application No. 95-5861-18, Virginia Beach, Virginia

Dear Colonel Reardon:

The U.S. Fish and Wildlife Service has reviewed the Department of the Army permit application, 95-5861-18, submitted by Eddie Vaughan, to extend an existing logging road and receive after-the-fact authorization for a borrow pit in Virginia Beach, Virginia. Your February 27, 1996 request for formal consultation was received on March 11, 1996. This document represents the Service's biological opinion on the effects of that action on the Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) in accordance with Section 7 of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1531 et seq.). A complete administrative record of this consultation is on file in this office. This letter also provides the separate comments of the Service and the Department of the Interior pursuant to the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), which are included following the biological opinion.

I. CONSULTATION HISTORY

01-10-96 The Service received information from the Corps about this violation/proposed project.

02-01-96 The Service participated in a visit to the project area with the Corps, applicant, a Virginia Department of Forestry representative, and a Natural Resources Conservation Service representative.

03-11-96 The Service received the Corps' request to initiate formal consultation and receive a draft of the biological opinion.

05-21-96 The Service received the Corps' comments on the draft biological opinion.

II. BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The existing infrastructure and the proposed activities are located in Virginia Beach, Virginia (Figure 1). The existing logging road was constructed in 1985 and subsequently widened to 33 feet. Two forks have been added to the road, each fork is 700 - 800 feet long and 25 feet wide. Material for these forks was excavated from alongside each fork. Each fork has two 24-inch pipe culverts installed for through-flow. A lateral ditch was excavated to convey roadside flow to the surrounding wetlands. Another 200-foot long road segment was constructed to connect two upland areas for logging purposes. A small borrow pit was excavated to obtain sand to be used on the logging roads. The applicant assumed that the work was covered by a silvicutural exemption to Section 404 of the Clean Water Act. However, this work occurred within the range of the Dismal Swamp southeastern shrew without Section 7 consultation, thus an exemption is not valid.

Currently, the applicant proposes to extend one fork of the existing logging road an additional 150 feet (25 feet wide) through forested wetlands to access the timber located on a ridge in the floodplain of the North Landing River (Figure 2). Construction of the road extension would impact approximately 3,800 to 5,300 square feet (0.09 - 0.12 acres) of forested wetlands adjacent to the North Landing River. The Corps is also considering the issuance of after-the-fact authorization for the 20-foot by 50-foot borrow pit and comparably-sized storage area for the excavated material. This borrow pit is located in forested wetlands adjacent to the existing logging road (Figure 2). A total of 2,000 square feet (0.046 acres) of wetlands were excavated or filled in relation to the borrow pit. Material from this borrow pit will be used to resurface the existing logging roads and may be used to provide some of the material needed for construction of the proposed logging road extension. The applicant has stated that he plans to log approximately 40 acres. After logging, the area will be sprayed with an herbicide, Arsenal, to encourage growth of loblolly pines or will be allowed to reseed itself with pines.

RANGEWIDE STATUS OF THE SPECIES

Life History

The Dismal Swamp southeastern shrew is a small mammal that weighs less than 0.2 ounces and measures approximately four inches in length. Little is known about the life history of the shrew. However, the species' life history is likely similar to that of the more common southeastern shrew (*S. l. longirostris*). Based on a few studies, it appears that southeastern shrews average approximately four

young per litter (U.S. Fish and Wildlife Service 1994). Pregnant southeastern shrews have been found in Indiana from 8 April to 25 September and in Alabama and Georgia from 31 March to 6 October (U.S. Fish and Wildlife Service 1994). Shrews of the genus *Sorex* usually have at least two litters per year (Churchfield 1990). It is likely that young shrews remain in the nest for their entire period of growth and development and are nearly adult size when they
leave the nest (U.S. Fish and Wildlife Service 1994). Southeastern shrews feed mainly on small-sized invertebrates, but consume some vegetation (U.S. Fish and Wildlife Service 1994). Typically, shrews forage intermittently throughout the day and night in all seasons and seem to have highest levels of activity associated with rainfall and periods of high humidity. Much of their foraging occurs in leaf litter or in tunnels in the upper layers of the soil (U.S. Fish and Wildlife Service 1994). Predators include barred and barn owls, domestic cats, and occasionally snakes, domestic dogs, and opossums (French 1980).

The Dismal Swamp southeastern shrew is found in a range of habitats including recent clearcuts, regenerating forests, young pine plantations, grassy and brushy roadsides, young forests with shrubs and saplings, and mature pine and deciduous forests (U.S. Fish and Wildlife Service 1994). The shrew is likely to exist at highest densities in early successional wetland habitats, such as cane stands; shrub-dominated areas; and young, open forests that retain a fairly dense herbaceous understory. The shrew also occurs at high densities within cleared rights-of-way, such as those used for utility lines, as these areas often contain early successional habitats such as scrub-shrub wetlands. Mature wetland forests also provide habitat diversity important to the integrity and dynamic structure of shrew populations across their entire range. Rose (1983) found that the shrew was most abundant in mid-successional, 12- to 15-year-old regenerating forests having a dense understory, moist organic soils, and moderate leaf litter.

Status of the Species Within its Range

The distribution of the Dismal Swamp southeastern shrew is considered coincidental with the boundaries of the historic Dismal Swamp, an extensive contiguous wetland complex that once occupied most of the low-lying land between Norfolk, Virginia and the Albemarle Sound in North Carolina. Historically, this wetland complex was maintained in a variety of successional stages (such as marshes, canebrakes, pocosins, and forest) by natural fires. The original Dismal Swamp ecosystem has been greatly reduced in size because of urban development and the clearing and draining of land for agriculture and silviculture. Most of the remaining wetlands are forested. Approximately 197,680 acres of these wetlands remain, more than half of which are preserved by the Service as the Great Dismal Swamp National Wildlife Refuge, created in 1974, which is in Virginia and North Carolina. The Service is attempting to restore some of the vegetational and successional diversity to the portion of the Dismal Swamp ecosystem within the Refuge. The Great Dismal Swamp State Park in North Carolina provides an additional 22 square miles of shrew habitat. There are additional areas of protected shrew habitat such as the North Landing River Preserve and the Northwest River Park in Virginia and Elizabeth City State University's Dismal Swamp Wetland in North Carolina.

Outside the protected areas, remnants of the Dismal Swamp are rapidly disappearing in southeastern Virginia due to development associated with the Hampton Roads metropolitan area (U.S. Fish and Wildlife Service 1994). In North Carolina, agricultural and silvicultural conversion are the main causes of habitat loss. "In the vicinity of Elizabeth City, North Carolina, for example, two tracts totaling some 32,000 acres of swamp have been cleared and drained within the past 20 years. Besides these contiguous tracts, many smaller areas within the historic Dismal Swamp of North Carolina have been ditched and cleared in a piecemeal fashion. In Virginia, a comparison of U.S.G.S. 7.5-minute topographic maps to recent aerial photography revealed a collective loss of some 2,600 acres of forested land, scattered over four maps portraying the Dismal Swamp (S. Martin, U.S. Army Corps of Engineers, pers. comm. 1993)" (U.S. Fish and Wildlife Service 1994).

Threats to the Species

The main reasons for the shrew's decline are habitat loss and modification and possible loss of genetic integrity through interbreeding with the more common upland subspecies (U.S. Fish and Wildlife Service 1994). "It is presumed that the Dismal Swamp southeastern shrew developed its distinctive size and coloration while geographically or ecologically isolated within the Great Dismal Swamp during the Holocene (Handley 1979). The recent human-induced progression toward homogenous mature hardwood forest, more representative of habitat conditions of the surrounding region, leads to the possibility that the more common and presumably more generally adapted . . . subspecies could invade the Dismal Swamp and genetically overwhelm the existing populations of *S. l. fisheri*, which are more specifically adapted to historic swamp conditions" (U.S. Fish and Wildlife Service 1994).

Recovery Accomplishments

Recently, new evidence suggests that the Dismal Swamp southeastern shrew may occur throughout the coastal plain of North Carolina, at least as far south as Wilmington (U.S. Fish and Wildlife Service 1994). However, until this can be substantiated through additional distribution and taxonomy studies, the shrew will remain on the Service's list of endangered and threatened wildlife and plants. As such, the shrew, and its habitat, will continue to receive protection pursuant to the ESA until it is removed from this list.

ENVIRONMENTAL BASELINE

As defined in 50 CFR 402.02 "action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. The "action area" is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The direct and indirect effects of the actions and activities resulting from the Federal action must be considered in conjunction with the effects of other past and present Federal, State, or private activities, as well as the cumulative effects of reasonably certain future State or private activities within the action area. The action area for this biological opinion

has been determined by the Service to include the entire 1,200 acre site owned by the applicant. This includes the existing borrow pit, proposed logging road extension, and area to be logged (approximately 41 acres).

Status of the Species - The forested wetlands in the action area are dominated loblolly pine (*Pinus taeda*), red maple (*Acer rubrum*), swamp tupleo (*Nyssa biflora*), red bay (*Persea borbonia*), and switchcane (*Arundinaria gigantea*). The Dismal Swamp southeastern shrew has not been documented within or in the vicinity of the action area. However, the applicant has chosen to assume this species is present in areas with appropriate habitat.

Effects of the Action - Direct impacts to the shrew associated with this project include the potential to crush shrews with vehicles and heavy equipment while clearing vegetation for and constructing the logging roads and during the logging operation, resulting in death or injury. Additionally, the shrew will be directly affected by the temporary loss of 41 acres from logging activities, the borrow pit, and the logging road. Additionally, the shrew will be directly affected by the permanent fill of 0.12 acres of habitat from the road construction. Also, 0.046 acres of habitat were already lost during the construction of the borrow pit and adjacent storage area. Although the 0.166 acres filled for the road and borrow pit will/have resulted in a loss of shrew habitat, because the road will only be used infrequently for logging operations, it is likely that leaf litter will accumulate on the road and some herbaceous vegetation may survive, thereby allowing for some use by shrews. The borrow pit will also have infrequent use and once the material in the storage area is utilized, the storage area is expected to naturally revegetate and be used by shrews. Because the permanent road will be narrow and the borrow pit is fairly small and both are surrounded by appropriate shrew habitat, no habitat fragmentation is expected. Logged areas will result in early successional vegetation that provides good habitat for shrews.

Indirect effects are defined as those that are caused by the proposed action and are later in time, but still are reasonably certain to occur (50 CFR 402.02). Indirect effects will result from the creation of a pine plantation. The pine plantation will not provide as high quality habitat as currently exists at the site. After logging, the area may be allowed to naturally regenerate, this will have no affect on the shrew. It is also unlikely that any herbicide treatment used to minimize hardwood growth will adversely affect the shrew.

While there is likely to be a loss of individual shrews, because there will only be a minor amount of completely unusable habitat created and no habitat fragmentation, this loss should not affect the genetic viability or range of the species. "Because these shrews have a high reproductive potential and rapid maturation rate, limited collection of individuals is not detrimental to healthy populations, although more widespread mortality associated with loss or permanent alteration of habitat continues to constitute the primary threat to the survival of this subspecies." (U.S. Fish and Wildlife Service 1994). Shrews from areas adjacent to and within the action area will recolonize the portion of the site where temporary impacts (i.e., logging) will occur.

Cumulative Effects - Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the ESA.

One future activity that will affect the shrew is additional logging of this site. The applicant owns 1,200 acres (not all in timber) at this site, but has not stated that additional logging is planned. However, because the logging road is permanent, it is reasonable to assume that additional logging will take place in the future. The road is proposed to be maintained, therefore, additional permanent habitat loss should not be necessary during future logging activities. However, it is likely that some shrews will be injured or killed during future logging operations. Because shrews are found in high densities in early successional habitat, future logging practices will not eliminate shrew habitat, and therefore, are not likely to detrimentally affect the shrew population in the action area over the long term.

CONCLUSION

After reviewing the current status of the Dismal Swamp southeastern shrew throughout its range and in the action area, the environmental baseline for the action area, the effects of the proposed clearing and construction, and the cumulative effects, it is the Service's biological opinion that the logging road extension, after-the-fact authorization for a borrow pit, and the logging, as proposed, are not likely to jeopardize the continued existence of the Dismal Swamp southeastern shrew. No critical habitat has been designated for this species, therefore, none will be affected.

III. INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

AMOUNT OR EXTENT OF TAKE

Previous studies have indicated that “mature forests with closed canopies...have densities of only 1-4

[shrews] per hectare" which is "only about one-fourth or less the densities of southeastern shrews compared to early successional stage habitats dominated by grasses and shrubs" (Rose 1995). Therefore, the Service anticipates that 41 Dismal Swamp southeastern shrews (approximately 2.5 shrews/hectare) will be taken during construction of the logging road and the logging operation and were taken for creation of the borrow pit and storage area. The incidental take is expected to be in the form of direct killing, harassment, and harm.

REASONABLE AND PRUDENT MEASURES

The measures described below are nondiscretionary, and must be implemented by the Corps so that they become binding conditions of any permit issued to the applicant in order for the exemption in Section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse. The Service considers the following reasonable and prudent measures to be necessary and appropriate to minimize take of the Dismal Swamp southeastern shrew.

1. Vegetation clearing and use of heavy equipment for road construction should be minimized. This will reduce soil and leaf litter disturbance, thereby minimizing impacts to shrews and their habitat.

2. Impacts to wetlands should be minimized. This will lessen the impacts to shrew habitat.

3. Avoid use of pesticides and herbicides. This will minimize impacts to the shrew.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. During construction and vegetation clearing activities associated with the road extension, vehicles and heavy equipment used for clearing and construction will remain within the 25-foot road width.

2. Clearing of vegetation in wetlands will be done by hand where practicable.

3. All work in wetlands will be done on mats where practicable.

4. No use of broad-spectrum aerial pesticide applications, except as needed for southern pine

bark beetle control/prevention.

5. Minimize use of broad-spectrum aerial herbicide applications where practicable.

6. The applicant is required to notify the Service before initiation of construction and upon completion of the project at the address given below. All additional information to be sent to the Service should be sent to the following address:

Virginia Field Office
U.S. Fish and Wildlife Service
P.O. Box 480
U.S. Route 17, Mid-County Centre
White Marsh, VA 23183
Phone: (804) 693-6694
Fax: (804) 693-9032

7. Care must be taken in handling any dead specimens of the Dismal Swamp southeastern shrew that are found in the project area to preserve biological material in the best possible state. In conjunction with the preservation of any dead specimens, the finder has the responsibility to ensure that evidence intrinsic to determining the cause of death of the specimen is not unnecessarily disturbed. The finding of dead specimens does not imply enforcement proceedings pursuant to the ESA. The reporting of dead specimens is required to enable the Service to determine if take is reached or exceeded and to ensure that the terms and conditions are appropriate and effective. Upon locating a dead specimen, initial notification must be made to the following Service Law Enforcement office:

Division of Law Enforcement
U.S. Fish and Wildlife Service
P.O. Box 187
Yorktown, VA 23690
(804) 890-0003

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures the Service believes that impacts to shrew habitat have been minimized.

IV. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to further minimize or avoid adverse

effects of a proposed action on listed species or critical habitat, to help implement recovery plans and other recovery activities, or to develop information to benefit the species.

The Service recommends that the Corps conduct before and after surveys for the Dismal Swamp southeastern shrew within the action area. This will allow our agencies to determine the exact effects of logging road and the logging on the shrew. If one or two surveys were conducted before clearing, construction, and logging are initiated and several annual surveys are conducted after project completion, valuable information could be obtained regarding use of the road by shrews and the extent to which shrews are impacted by logging. This information could be used in future consultations to better determine the extent of project impacts and evaluate the effectiveness of the terms and conditions provided in biological opinions. Additionally, the Technical/Agency Draft of the Recovery Plan (U.S. Fish and Wildlife Service 1994) for this species indicates that "more information is needed on the distribution and abundance" of the shrew outside the Refuge. Any information on shrew distribution or abundance obtained from the action area would enhance the recovery of this species. The Service would be pleased to work with the Corps to design such a study.

In order for the Service to be kept informed of actions that minimize or avoid adverse effects or benefit listed species or their habitats, the Service requests notification of the implementation of any of these conservation recommendations by the Corps.

V. REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the Corps' request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Unless information in this biological opinion is protected by national security or contains confidential business information, the Service recommends that you forward a copy to the following agency:

Virginia Department of Game and Inland Fisheries
Environmental Services
P.O. Box 11104
Richmond, VA 23230

If this opinion is not provided by the Corps and does not contain national security or confidential

business information, the Service will provide a copy to this State agency ten business days after the date of this opinion.

FISH AND WILDLIFE COORDINATION ACT COMMENTS

The following comments constitute the report of the Service and the Department of the Interior on this project and are submitted under provisions of the FWCA:

o. After a permit is issued for the proposed project, we recommend that any additional permits issued to this applicant do not allow for excavation of wetlands for use as fill.

The Service appreciates this opportunity to work with the Corps in fulfilling our mutual responsibilities under the ESA and FWCA. Please contact Cindy Schulz of this office at (804) 693-6694 if you require additional information.

Sincerely,

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

LITERATURE CITED

Churchfield, S. 1990. The natural history of shrews. Cornell University Press; Ithaca, NY.

French, T.W. 1980. Natural history of the southeastern shrew, *Sorex longirostris* Bachman. American Midland Naturalist 104:13-31.

Handley, C.O., Jr. 1979. Mammals of the Dismal Swamp; a historical account. Pages 297-357 in P.W. Kirk, Jr., eds., The Great Dismal Swamp. University Press of Virginia; Charlottesville, VA.

Rose, R.K. 1983. A study of two rare mammals endemic to the Virginia/North Carolina Dismal Swamp. Unpublished report prepared for U.S. Fish and Wildlife Service; Newton Corner, MA.

Rose, R.K. 1995. Final report of the field study to determine the presence of the federally threatened Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) on the property of Southeastern Virginia et al. and the property known as Fountaingate, located near London Bridge Road between Lake Placid Estates and the Piney Ridge subdivision in Virginia Beach, Virginia. Submitted to Thomas A. Stierhoff, Stokes Environmental Associates, Ltd., Norfolk, VA.

U.S. Fish and Wildlife Service. 1994. Dismal Swamp southeastern shrew (*Sorex longirostris fisheri*) recovery plan. Technical/agency draft. Hadley, MA. 51pp.

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bcc: ARD-South, Region 5
Endangered Species Coordinator, Region 5
CBFO Reading File
Endangered Species Biologist, CBFO
Law Enforcement, Yorktown
(Attn: Dan Hurt)
Law Enforcement, Richmond
(Attn: Senior Resident Agent)

<u>10 business days after the date of this letter, mail copies to:</u>
VDGIF, Richmond
(Attn: Environmental Services)
DNH, Richmond
(Attn: Tom Smith)